

In the Claims:

Please amend the claims as follows:

1. (Currently amended) A bipolar junction transistor, comprising:  
an intrinsic collector region of first conductivity type in a semiconductor  
substrate;

a trench in said substrate, adjacent said intrinsic collector region;

5 a base electrode of second conductivity type in the semiconductor  
substrate, said base electrode comprising a trench-based electrode portion that  
extends in said trench and a lateral base electrode extension that extends  
outside said trench;

10 an extrinsic base region of second conductivity type that is self-aligned  
and electrically connected to said lateral base electrode extension and forms a  
P-N rectifying junction with said intrinsic collector region;

15 an intrinsic base region of second conductivity type that is self-aligned to  
said lateral base electrode extension, has a lower second conductivity type  
doping concentration therein relative to said extrinsic base region and forms a P-  
N rectifying junction with said intrinsic collector region;

a trench insulating layer that lines a bottom and sidewalls of said trench  
and prevents direct electrical contact between the trench-based electrode portion  
of said base electrode and said extrinsic base region by blocking charge transfer  
across the sidewalls of said trench; and

20 an emitter region of first conductivity type that forms a P-N rectifying  
junction with said intrinsic base region.

Claims 2-4 (Canceled).

5. (Previously presented) The transistor of Claim 1, wherein said emitter  
region is self-aligned to a sidewall of the lateral base electrode extension.

6. (Previously presented) The transistor of Claim 1, wherein said trench is ring-shaped; and wherein said extrinsic base region is ring-shaped.

7. (Previously presented) The transistor of Claim 5, further comprising:  
an electrically insulating sidewall spacer on the sidewall of the lateral base electrode extension; and

5 an emitter electrode of first conductivity type on the surface of said substrate and on said electrically insulating sidewall spacer.

8. (Original) The transistor of Claim 7, further comprising a buried extrinsic collector region of first conductivity type in said substrate, said buried extrinsic collector region forming a non-rectifying junction with said intrinsic collector region.

10 9. (Original) The transistor of Claim 8, wherein an inner sidewall of said trench defines an intrinsic collector region mesa that extends between said buried extrinsic collector region and the surface of said substrate.

15 Claims 10-26 (Canceled).

27. (Currently amended) A bipolar junction transistor, comprising:

20 an electrically insulating layer on a surface of a semiconductor substrate having an intrinsic collector region of first conductivity type therein, said electrically insulating layer comprising a composite of a first electrically insulating material layer and a second electrically insulating material layer on the first electrically insulating material layer and having a lateral recess therein that  
25 extends along an undersurface of the second electrically insulating material layer;

a trench that extends into the surface of the semiconductor substrate and into the intrinsic collector region and is self-aligned to an opening in said electrically insulating layer;

30 a base electrode of second conductivity type having a first portion that extends in said trench and a second portion that extends into the lateral recess within said electrically insulating layer;

a base region of second conductivity type that is self-aligned and electrically connected to the second portion of said base electrode extending into  
35 the lateral recess and forms a P-N rectifying junction with said intrinsic collector region;

a trench insulating layer that lines a bottom and sidewalls of said trench and extends between the first portion of said base electrode and said base region so that ~~any direct electrical connection between~~ charge transfer across  
40 the sidewalls of said trench from the first portion of said base electrode to ~~[[and]]~~ said base region is blocked; and

an emitter region of first conductivity type that forms a P-N rectifying junction with said base region.

45 28. (Canceled).